



Pacific Island Network *Quarterly*

Quarterly Newsletter of the
Pacific Island Network (PACN)
Inventory & Monitoring Program
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The National Park Service (NPS) has implemented natural resource inventory and monitoring on a servicewide basis to ensure all park units possess the resource information needed for effective, science-based management, decision-making, and resource protection.

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NOTE: Unless indicated all photos and articles are NPS.

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ALKA News

On February 21st, representatives from the National Park Service, the State of Hawaii, and Hawai'i County joined together to sign a memorandum of understanding for the Ala Kahakai National Historic Trail. The M.O.U. focused on establishing the trail and setting forth the roles and responsibilities of each partner agency in protecting and preserving the 175-mile trail corridor.

The primary focus of the agreement will be the implementation of the comprehensive management plan for the Ala Kahakai National Historic Trail, which was designated by Congress in 2000. The plan, released in May 2009, establishes management guidelines needed to fulfill the preservation and public use goals that were the result of community input gathered at island-wide meetings.

— Ida Hanohano, ALKA Ranger
from InsideNPS, March 3, 2010

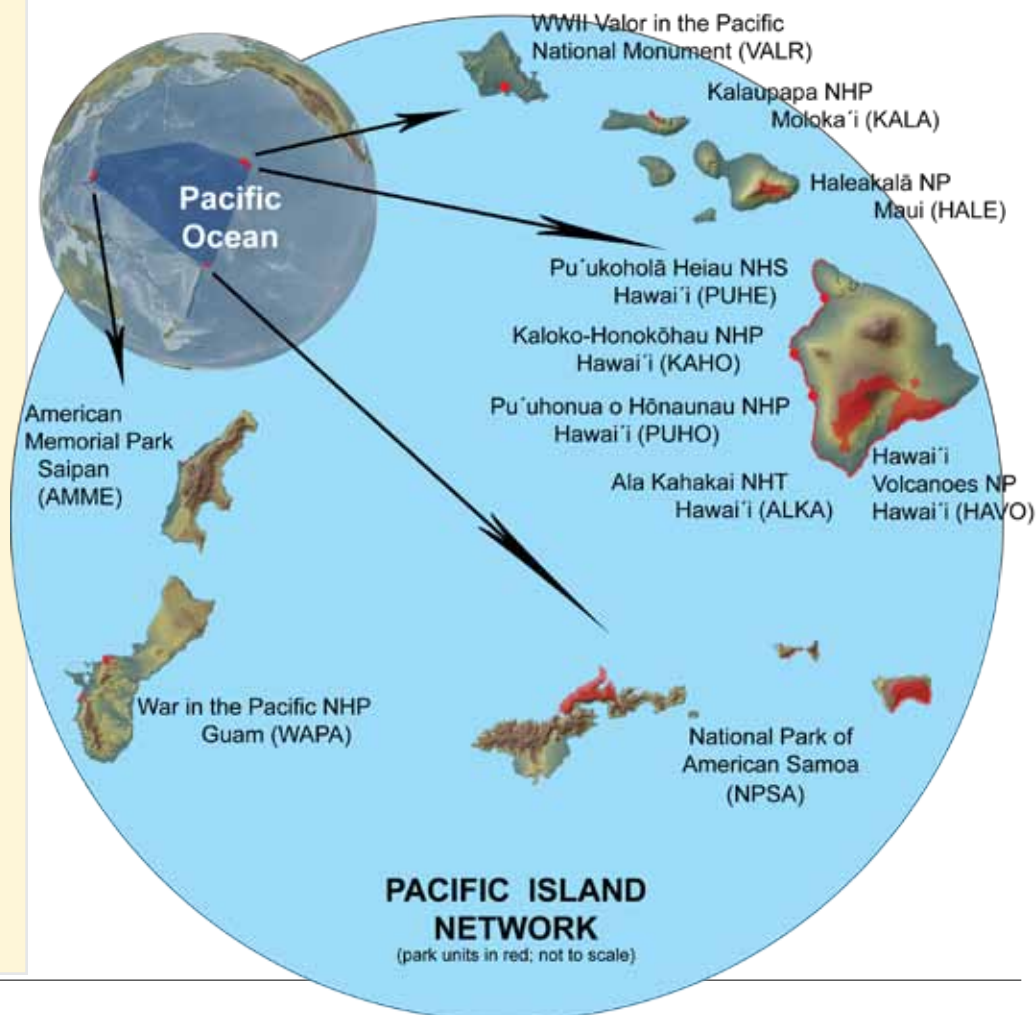
Staffing News

The Inventory & Monitoring program is staffing up in preparation for increased field work as more monitoring protocols are implemented and reports created.

Ben McMillan and Tonnie Casey will be starting in late March. Ben will be I&M's new GIS Specialist. He brings a wealth of knowledge and experience to the program. Tonnie will serve as a technical focused biotech who will work on climate monitoring, all phases of report production, and as a field worker when needed.

In addition, the vegetation crew continues to grow as we prepare to tackle plant communities monitoring. New plant biotechs Laura Arnold, Daemerson Awong, and Reid Loo are set to join the field crew very soon.

Another plant biotech and a half-time administrative assistant will be hired by early April.



Featured Staff

Cory Nash is embarking on his sixth year with the I&M Program as the CESU Science Communications Coordinator. From his humble beginnings growing up in small-town Ohio, Cory's life has been punctuated with movement. He attended three high schools, one of them in France. He spent a semester of undergrad in Luxembourg City while studying Political Science, International Studies, and French. He married a lovely woman named Sarah with whom he spent 2.5 years on the side of a



mountain in Morocco while serving in the Peace Corps. They later had the good fortune of attending graduate school in England where Cory received an MSc. in Environment and Development. From there, the 7,300 mile migration to Hawaii seemed almost natural. Although only intending to stay in Hawaii for six months, Cory and Sarah have found it extraordinarily difficult to leave such an amazing place. So, they bought a house and had an energetic little boy named Lochlan. He is pretty much all of the movement they can handle right now.

Kimberly Tice was born and raised in Kailua, O'ahu, Hawaii. After earning her Bachelor's degree in Biology at Bowdoin College in Brunswick, Maine, she studied birds in locations ranging from the Galápagos, Ecuador to Kent Island, New Brunswick, Canada. She then decided to broaden her horizons, and entered graduate school at the University of Hawai'i at Mānoa to study marine biology. After completing her thesis on the genomics and morphometrics of an endemic Hawaiian intertidal snail, she graduated with her Master's

degree in Zoology in December of 2009. She is very excited to have been recently hired as a Biological Science Technician at Kalaupapa National Historical Park.



Monitoring Schedule

April

Focal terrestrial plant community monitoring in wet forest at HAVO
Vegetation mapping field data collection at HAVO
Vegetation mapping field data collection on Ta'u island at NPSA
Complete vegetation mapping accuracy assessment field work in West Hawai'i parks
Land bird monitoring in HAVO

April 5-9

Marine, freshwater, and brackish water quality monitoring at KALA

April 12-16

Stream water quality monitoring at HALE

May

Land bird monitoring in HAVO
Wet forest plant communities monitoring at HAVO
Vegetation mapping field data collection on Tau island at NPSA
Vegetation mapping field data collection at HAVO
Benthic and marine fish monitoring at WAPA
Freshwater and marine water quality monitoring at WAPA
Water quality and groundwater monitoring at AMME
Water quality monitoring at HALE
Freshwater stream animals monitoring at HALE

June

Wet forest plant communities monitoring at HAVO
Vegetation mapping field data collection at HAVO
Freshwater stream animals monitoring at NPSA
Freshwater and marine water quality monitoring at NPSA

Planning for the Future of Our Coral Reefs

Few resources are as threatened by human actions and climate change as coral reefs. Overfishing, sedimentation, and groundwater contaminants degrade our reefs. Warmer and more acidic oceans pose a serious threat to the very survival of our reefs which will only worsen in the decades to come. The need to address these issues led National Park Service ma-

rine scientists and managers to Honolulu on January 26th and 27th to lay the groundwork for the development of a strategic plan for coral reef management in the national parks of the Pacific Island Network.

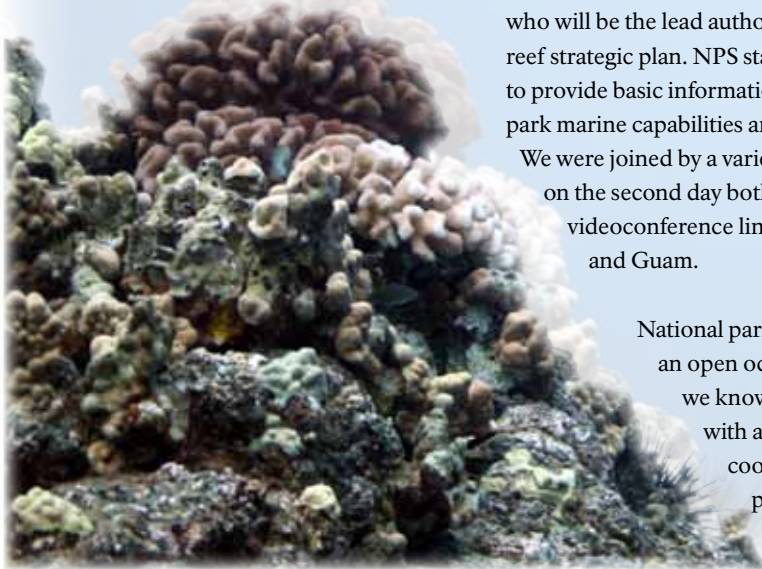
The meeting was facilitated by Gary Davis, retired former NPS Chief Ocean Scientist, who will be the lead author of the PACN coral reef strategic plan. NPS staff met the first day to provide basic information about individual park marine capabilities and coral reef needs. We were joined by a variety of agency partners on the second day both in person and by a videoconference link to American Samoa and Guam.

National park coral reefs are in an open ocean ecosystem and we know we need to work with all of our partners to coordinate strategies and pool resources. Coral reefs are also im-

portant community resources; education and outreach to adjacent communities was a major discussion point because almost all of our management actions need community support to be successful. National Park of American Samoa Marine Ecologist Peter Craig's presentation demonstrated that nearby human populations are correlated to dramatically lower fish biomass on the reef which highlighted our need to spread the message of coral reef conservation.

A few other dominant themes in the discussion which will be incorporated into the strategic plan include developing better mechanisms to share data, defining science-based desired future conditions for park coral reefs, designing and monitoring Marine Protected Areas, developing a carbon neutral coral reef program, and – key to all of these issues – strengthening and expanding science and community partnerships. Gary Davis is now incorporating comments on a draft of the plan which will be finalized later this year.

— G. Kudray, PACN Program Manager



GIS Tips and Tricks - Go to XY

One of my favorite tools in ArcMap is the "Go To XY" tool.

It allows you to quickly draw any point location on a map if you know the coordinates in LAT LONG or UTM.

How to add the "Go To XY" tool to ArcMap:

- In ArcMap, click on *Tools -> Customize*. Select *Commands* tab.
- Under *Categories*, scroll down and select *Map Navigation*.
- Under *Commands*, select *Go To XY*. Hold down left mouse button, drag and drop the icon on the *Data View Tools* toolbar.

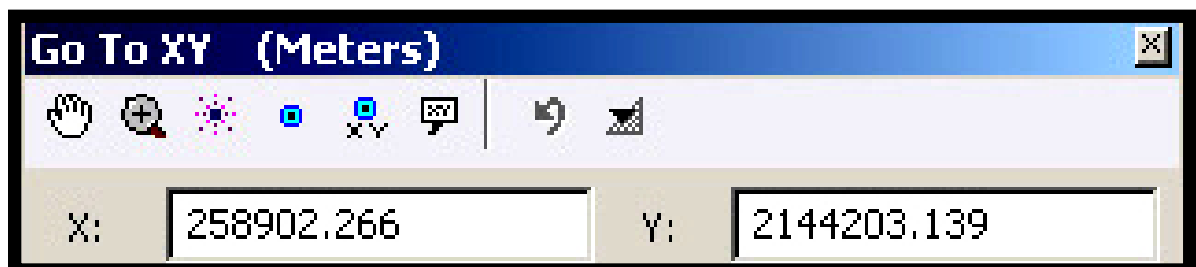
How to use the "Go To XY" tool:

- In ArcMap, click the *Go To XY* button. Click on the *Data View Tools* toolbar to open dialog box.
- Click *Units* button to choose the units of the coordinates you want to enter (Meters, Decimal Degrees, or Degrees, Minutes, Seconds, etc.)
- Enter the XY or LAT LONG coordinates in the appropriate boxes.
- Click the *Add Point* button to draw the point on the map at the coordinates you entered.

- Other drawing options: Add a labeled point showing the coordinates, add a callout, pan or zoom to the point, flash the location, etc.
- You can also save the point permanently as a shapefile with the *Convert Graphics to Features* command.

— V. Doan
GIS Technician

For more information on the "Go To XY" tool, check out ArcGIS Desktop Help.



Communicating Byte by Delicious Byte

You can never replace the power or feeling of a physical visit to a national park. The overwhelming cultural identifications and experiences of a sacred site or a tragic battlefield, the smells of sulfur or 'ōhi'a trees at day break, the song of the Micronesian honeyeater, or the vibrant colors of the giant clam cannot be truly experienced without a visit. Not everyone has the luxury to expose themselves to these places first hand. However, stories can be told and nature can be shared in many ways.

The internet dramatically changed the way we communicate nearly 20 years ago. Information now travels at the speed of light (or molasses, depending on your connection). Today, many people communicate in sound bites, headlines, and Tweets™ in a fast-paced competition for an individual's attention. These condensed bursts of information have the capacity to reach far beyond the traditional audiences often targeted by National Park Service communications. The National Park Service contributes to the narratives of the wonderfully rich, historically important, and beautiful places that we are charged with protecting, understanding, and interpreting. As we become more accustomed to the relevance of modern media, we must adapt or risk losing out on thousands of natural and cultural resources connections with the public.

The Pacific Island Network does not want to miss these connections. We have enhanced our website with educational monitoring videos, engaged with social networking, and distribute materials on a regular blog and through iTunes™. Perhaps the most exciting new outreach project that we are in the process of developing is an interactive and educational coral reef web product for seventh graders to use in the classroom. (More on that project as information becomes available.)

Many of the national park units in the

Pacific islands have launched modern technology-based outreach initiatives of their own, with dramatic success. For example, Hawai'i Volcanoes National Park podcasts have remained in the top 25 most popular iTunes™ podcasts within the *Government & Organizations* category for well over a year. Several parks including Pu'ukoholā Heiau NHS now offer guided tours through the historic site accessible through your cell phone. Six parks are even on Twitter™. These are just a sample of the many tech savvy programs that national parks are embracing in the Pacific islands. If you can, come and visit a park, but if that is not possible, then download a few bytes

and bring the experience to yourself.

— C. Nash, Science Communications



Follow the links below to see what you've been missing

Monitoring Videos — Travel to the field with National Park Service scientists as they collect data on unique Pacific island resources.
http://science.nature.nps.gov/im/units/pacn/outreach/vs_videos.cfm

Pacific Island Parks Blog — Catch daily park stories and news from across the network, or better yet subscribe to the RSS feed to receive updates directly.
<http://pacificislandparks.com/>

Cell Phone Tours, Podcasts, Webcams, and Social Networking

Pu'ukoholā Heiau National Historic Site
<http://www.nps.gov/puhe/photosmultimedia/index.htm>

Hawai'i Volcanoes National Park
<http://www.nps.gov/havo/photosmultimedia/index.htm>

World War II Valor in the Pacific National Monument
<http://www.nps.gov/valr/photosmultimedia/multimedia.htm>

Haleakalā National Park
<http://www.nps.gov/hale/photosmultimedia/index.htm>

National Park of American Samoa
<http://www.nps.gov/npsa/naturescience>

Pacific Island Network — Inventory Report

Nearshore Vertebrates in Four Hawai'i Parks

The ocean's resources have been dwindling for decades both on local and global scales. Today, coastal resources in Hawaii and elsewhere are facing unprecedented negative changes due to factors such as coastal development, global climate change, and overexploitation. Marine vertebrates, especially fishes, have suffered enormous declines. For example it is estimated that the global decline of large predatory fishes exceeds 90%. The near-extirpation of apex predators and heavy exploitation in the main Hawaiian Islands from intensive fishing pressure has resulted in a stressed ecosystem that does not contain the full complement of species and interrelationships which would normally prevail.

To help document this trend, a recent inventory for marine vertebrates was done at four national park units in Hawaii: Kalaupapa National Historical Park (NHP), Pu'ukoholā Heiau National Historic Site (NHS), Kaloko-Honokōhau NHP, and Pu'uhonua o Hōnaunau NHP.

Marine ecosystems such as subarctic areas, kelp forests, and coral reef communities present unique challenges for scientific study, monitoring, and conducting biological inventories. To collect data on the reefs, divers must frequently work in difficult environmental conditions and in fragile communities where most organisms take shelter in holes and crevices. However, in order for organizations to effectively manage these resources, coral reef communities must be identified and their current conditions documented.

Despite these obstacles, a total of 178

fish species were observed in the marine waters adjacent to all four parks, including 48 endemic species. Although the greatest number of fish species were found at Kaloko-Honokōhau NHP, the park with the most overall fish by number of fish and weight was Kalaupapa NHP. Kalaupapa NHP's underwater habitat is characterized by large boulders and low (less than 10%) coral cover. Pu'uhonua o Hōnaunau NHP and Kaloko-Honokōhau NHP contain fewer and generally smaller fish, and the habitats consist of smaller volcanic rocks with more coral. Pu'ukoholā Heiau NHS supported the fewest fish

due to a greater proportion of sand and degraded habitats. (It should be noted that fishing pressure in W. Hawai'i parks is also greater than at Kalaupapa NHP.)

Marine reptiles and mammals such as threatened green sea turtles (*Chelonia mydas*), dolphins, and whales were commonly observed in three of the four parks. The endangered Hawaiian monk seal (*Monachus schauinslandi*) is a frequent visitor to Kalaupapa NHP, and has been observed at the

other parks as well.

This inventory adds to the crucial foundation of knowledge from which to assess future conditions of marine vertebrates in these four national park units. Knowing what our shared resources are like now will help us to detect how they are changing at a later date. Through educated and collective stewardship of the nearshore communities, let's strive to achieve a future where conditions will only improve each time we survey or monitor underwater.

For the complete report, please visit: <http://www.botany.hawaii.edu/faculty/duffy/techr/168/v168.pdf>

Can you guess what this is ?

A. *(Diiodon hystrix)*
The skin of a porcupinefish



Blue Soft Coral: Menace to Reef Society or Good Neighbor?

Recent observations in West Hawai'i national parks raised questions and potential concerns that a small blue soft coral may be spreading on coral reefs, possibly interfering with hard reef-building coral development and survival. After focused field observations, and literature and data review, I put together the following information and management recommendations.

First, a few notes about soft

corals: Soft corals are in the phylum Cnidaria which includes jellyfish, sea anemones, and hard corals. All have single or multiple cup-shaped bodies called polyps, with a mouth surrounded by a ring of tentacles containing stinging cells used for defense or to catch prey. The cnidarian life cycle typically includes floating planktonic stage(s) and a stationary sea floor stage.

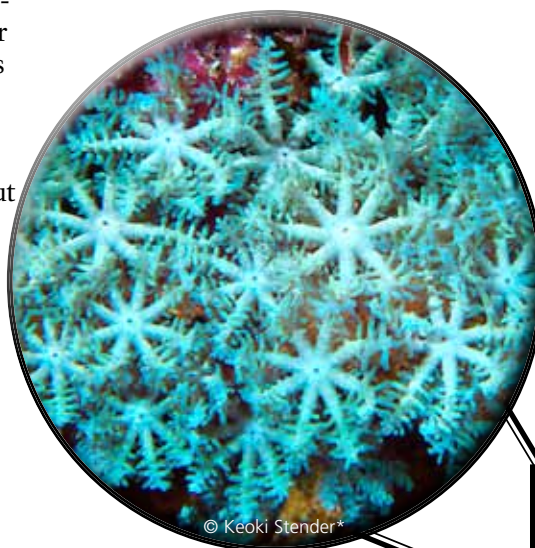
Although commonly called soft corals, these critters are not actually close relatives of the "hard" or "true" corals. Blue soft corals (*Sarcothelia edmondsoni*) are short, light blue clusters of colonial polyps with separate sexes that brood their young outside of their bodies. Colonies consist of many interconnected, tiny, up-turned mouths, each surrounded by 8 feather-like tentacles (see photo). There is some scientific confusion about whether this or a similar new species is endemic, native, or invasive. The blue soft coral has no known traditional or modern uses. Its only known predator is a sea slug.

Suspension, or filter-feeding animals like blue soft corals eat small particles floating in the water as plankton. This plankton includes microscopic algal spores and larvae of marine animals like other corals, crabs, sea urchins, and snails. Dense blankets of blue soft corals can eat a substantial amount of plankton and could prevent other species from settling or colonizing where these filter-feeding colonies occur. These processes would result in ecological competition for food and space on the sea floor. As a

consequence, a significant increase in the soft corals' dense coverage could have a profound negative influence on other reef organisms.

Based on recent observations we asked: Could this species be a problem to the reef ecosystem? Has the area of ocean bottom covered by these animals increased?

Blue soft corals live throughout the main Hawaiian islands, occurring in all West Hawai'i national parks, but are not known to occur in other Hawaii national parks. They generally live in shallow waters where they can tolerate reduced light due to high turbidity from suspended sediments, and low salinity due to freshwater seeps. Blue soft corals form a patchy but distinct horizontal band along shore up to 2 meters deep in shallow subtidal habitats. In the past, these animals have been reported to dominate sea floor cover in much of the deeper marine environment at Kaloko-Honokōhau NHP (KAHO).



Studies from the 1970s -1990s indicate that the blue soft coral covered 50–90% of the sea floor in the extensive shallow habitats of KAHO. It was also found in the deep coral slope habitat with 10–50% cover living on dead finger coral skeletons. The soft

coral was also common at Pu'ukoholā Heiau NHS (PUHE) and Pu'uhonua o Hōnaunau NHP (PUHO). More recent work, including coastal inventories and sea floor monitoring between 10–20 meter depths, found that blue soft coral was not seen at PUHE in 2005, yet was abundant there in shallow water in 2009. While common at PUHO in the 1960's, in 2005 it only accounted for 0.04% of sea floor cover. Also, on average blue soft coral declined at KAHO from 11% cover in 2005 to 3% in 2008. So, blue soft corals have varied in abundance over time in shallower and deeper waters, and there is no apparent trend indicating an increase or decrease in overall cover.

These observations point to the important role of history, including natural history and even well-documented observations or anecdotal information, in both ecology and management. Without a historical perspective, observations or data can be misinterpreted and any resulting management actions could be inappropriate or inadequate. In this case, recommended management actions include: continuing (1) frequent field observations of blue soft coral and other potential invasives; (2) annual monitoring; (3) communications with other parks and agencies on resource trends, and; (4) if future information indicates an increase in blue soft coral, or a correlation with a decrease in hard coral, conduct further research to determine what other management actions might be applied.

— L. Basch, Marine Ecologist



Finding Inch-wide Wells in a 133 Acre National Memorial Park

From February 4th to 9th, 2010, scientists from the NPS Inventory and Monitoring Program traveled to Saipan to establish a groundwater monitoring station at American Memorial Park (AMME). The team included myself (Chris Rillahan stationed at War in the Pacific National Historical Park (WAPA) on Guam), Greg Kudray, Tahzay Jones, and Anne Farahi stationed at Hawai'i Volcanoes National Park (HAVO). We were also accompanied and assisted by Scott Izuka, a hydrologist from USGS.

The objectives of our trip were to:

- (a) locate the two existing well sites,
- (b) place a CTD (an instrument that measures water conductivity, temperature, and depth) in each well,
- (c) record and survey reference marks for each well, and
- (d) leave the CTDs in the wells for a period of time to collect preliminary data.

Although our goals were practical, there were several unknown factors that inhibited us from developing a clear methodology. For example, the two wells had not been used in twenty years.

Luckily, Mr. Victor Hocog from the AMME maintenance division was able to aid us in our search for the wells. Not only is Mr. Hocog exceedingly familiar with the grounds of AMME, he welcomes any visitor with his sense of culture and island hospitality. He even gave us some of his famous homemade Saipan coconut soup as a much-needed mid-day snack. With his assistance, we were able to find the wells within the first hour of searching. Each well was cut flush to the ground with an opening that was only one inch in diameter. These dimensions, which were previously unknown to us, made it difficult to adequately insert the CTD instruments into the wells without an external housing. We searched several hardware stores on Saipan for the materials to build the external housings, but none could be found. We therefore



Chris uses surveying equipment to reference a groundwater monitoring well in front of the American Memorial Park sign

had to combine our ideas and previous experiences to successfully insert the CTDs into each well for the preliminary monitoring.

Over the next couple days our team calibrated the CTDs, measured salinity-depth profiles, and measured the depths to the water in the wells. The instruments were subsequently left to run for 24 hours to ensure that data were being collected accurately. We placed bolts in the ground near each well as reference marks in case they become damaged in the future. The wells were surveyed and the data recorded to establish a baseline to compare against future changes that might occur.

After the 24 hour trial period, the CTDs were placed in each well and the wells were closed. I returned after one month to collect the preliminary data and to

install the specially-ordered external housings on each well. The data will be used to determine the depth at which the CTDs should be located in the wells. The instruments were then placed back inside of the wells, and data will be collected and monitored every two months in perpetuity.

— C. Rillahan, Biotech



Using available resources and ingenuity from the entire team, they cobbled together effective monitoring technology



Although the covers are several inches wide the actual well opening is only an inch in diameter; presenting an unanticipated challenge to the monitoring team